



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,152	01/19/2006	Mark E. McNie	124-1146	8102
23117 7590 12/09/2009 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER SMITH, CHAD				
ART UNIT 2874		PAPER NUMBER		
MAIL DATE 12/09/2009		DELIVERY MODE PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/565,152

Applicant(s)

MCNIE ET AL.

Examiner

Chad H. Smith

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 and 47 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-13 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-9, 14-19, 21-35, 37-43 and 47 is/are rejected.
- 7) ☒ Claim(s) 20 and 36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

With regards to the arguments presented on pg. 1 of the Pre-Appeal Request, "The Examiner's failure to properly construe Applicants' independent claims and specifically including the terms "modulation means" and "output means" as covering the corresponding structures disclosed in the specification (and equivalents thereto) is clearly violative of 35 USC § 112 (6th paragraph) and is reversible error", Examiner agrees with Applicant's representative that it was improper to reject the claims based on function limitations as the claims were invoking U.S.C. 112 par. 6.

With regards to the arguments presented on pg. 2 of the Pre-Appeal Request, "Examiner again fails to identify any portion of page 347 or its figures as purporting to show a "quarter-wave plate", Applicant is advised to look at page 347 as both figures clearly show a quarter-wave plate to the left of the half wave plate. The plate is labeled as " $\lambda/4$ " and is located in the transmit/receive path, as noted with the bidirectional arrows in the waveguide.

With regards to the arguments presented on pg. 2 of the Pre-Appeal Request, "While the polarization of the beam may be shifted by passage through the quarter-wave plate, there is no modulation of the beam in any fashion", again Examiner believes that a quarter wave plates does modulate the laser beam, as the quarter wave plate both attenuates the signal to some degree and shifts the polarization as dictionary.com defines **modulate as to regulate or adjust to a certain measure or proportion.**

With regards to the arguments presented on pg. 3 of the Pre-Appeal Request, "there is no evidence suggesting that Jenkins teaches such a modulation means because there is no indication

in Jenkins, or even in the paragraph cited by the Examiner, that there is any "information modulation" taking place", Examiner points to col. 27, lines 35 and 36 of '596 as it recites "...to perform remote scene distance measurement." The information, being produced by the AO modulator, is being modulated by the quarter wave plate (834) as it exits through waveguide 850. Furthermore, Foord et al. teaches a laser beam exiting the apparatus and returning through the quarter wave plate as this return signal is the information to be modulated by the quarter wave plate.

With regards to the arguments presented on pg. 3 of the Pre-Appeal Request, "The Examiner states, on page 3, line 6, that Jenkins teaches a "modulation means (850)" but a review of the Jenkins reference at column 24, line 59 indicates that item 850 is a "waveguide" which is certainly not an information modulator of any type", Applicant's representative in the previous action was pointed to the citing of col. 27, lines 33 – 36, and 850 was referring to the cited waveguide.

With regards to the arguments presented on pg. 3 of the Pre-Appeal Request, "The Examiner contends that Akashi teaches the claimed output means, but does not provide any claim construction of the "output means" or identification of the "output means" in Akashi as being an example of the output means used in Applicants' specification and thus covered by Applicants' claims", the Examiner has clarified his rejection as set forth below.

Allowable Subject Matter

Claims 10, 11, 12 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the apparatus comprises a plurality of lasers, as this would entail a whole new structure of the mirrors and hollow waveguide configuration. Claims 11 – 13 are allowable based solely on their dependence of claim 10.

Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, taken alone or in combination, fails to disclose or render obvious wherein at least one of said beam shaping means comprises a tapered hollow core optical waveguide.

Claim 36 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the substrate comprises a silicon on insulator (SOI) wafer.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 9, 16-19, 21, 33, 35, 37 – 43 and 47 is rejected under 35 U.S.C. 102(b) as being anticipated by Jenkins et al. (U.S. Patent # 5,917,596).

In Re claims 1 and 9, '596 teaches a transmitter apparatus comprising one or more lasers (804), modulation means (834, QWP) for information modulating (information is from the AO modulator, col. 27, lines 32 – 36) radiation output by each of said one or more lasers, and output means (850) for outputting the modulated radiation produced by the modulation means; and hollow core optical waveguides formed in a substrate for guiding radiation from the one or more lasers to the modulation means and from the modulation means to the output means (838, 840, 844, and 848).

In Re claims 2 and 3, '596 teaches a discrete modulator in an alignment slot (834, fig. 14).

In Re claim 16, '596 teaches a detector (818).

In Re claim 17, '596 teaches an optical isolator (832).

In Re claims 18 and 19, '596 teaches beam shaping means (814).

In Re claim 21, '596 teaches an electro optic modulator (col. 27, line 33).

In Re claims 33, '596 teaches a transmitter (804) and a receiver (818).

In Re claim 35, '596 teaches alumina (904).

In Re claims 37 and 38, applicant is claiming the product including the process of making the transmitter apparatus, and therefore are of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. In re Thrope, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. In re Brown and Saffer, 173 USPQ 685 and 688; In re Pilkington, 162 USPQ 147. As such no weight is given to the process steps recited in claims 37 and 38.

In Re claim 39, '596 teaches rectangular cross section (fig. 15).

In Re claim 40, '596 teaches fundamental mode propagation (col. 23, lines 51 – 53).

In Re claim 41, '596 teaches multiple optical modes (col. 25, lines 27 – 30).

In Re claim 42, '596 teaches an alumina block (822).

In Re claim 43, '596 teaches a base and lid portion (312 and 316, respectively).

In Re claim 47, '596 teaches a transmitter apparatus comprising: one or more lasers (804), a modulator for information modulating radiation output by each of said one or more lasers (col. 27, lines 33 – 36), a transmitter for outputting the modulated radiation produced by the modulator (850); and hollow core optical waveguides formed in a substrate for guiding radiation from the one or more lasers to the modulator and from the modulator to the transmitter (838, 840, 844, and 848).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. (U.S. Patent # 5,917,596) in view of Akashi et al. (U.S. Patent # 6,934,448 B2).

In Re claims 5 and 6, '596 teaches the apparatus of claim 1 as previously discussed above, but is silent to the output means arranged to couple to an optical fiber or an attachment means. '448 teaches attaching an optical fiber via a v-groove through the use of an adhesive on a semiconductor substrate for alignment to the laser diode (col. 14, lines 1 – 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of '596's transmitting apparatus with a hollow waveguide with '448's teaching attaching an optical fiber via a v-groove through the use of an adhesive on a semiconductor substrate and integrating the use of an adhesive on a grooved area for attaching an optical fiber at the output of '596's transmitting apparatus, which then allows for a multitude of mounting

arrangements of the transmitting apparatus as the optical fiber can be easily maneuvered to direct the output at the desired target.

In Re claim 8, '448 teaches mode matching means (51).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. (U.S. Patent # 5,917,596) in view of Akashi et al. (U.S. Patent # 6,934,448 B2) and further in view of Nelson et al. (U.S. Patent # 3,984,332).

The previous combination teaches the apparatus of claim 6 as previously discussed above, but is silent to a lensed output optical fiber. '332 teaches a lensed output optical fiber (col. 4, lines 37 – 40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with '322's teaching of a lensed output optical fiber to minimize dispersion.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. (U.S. Patent # 5,917,596) in view of Klaver (U.S. Patent # 6,577,400 B1).

In Re claims 14 and 15, '596 teaches the apparatus of claim 1 as previously discussed above, but is silent to the one or more lasers being a wavelength tunable semiconductor laser. '400 teaches using a wavelength tunable semiconductor laser in an interferometer (20). It would

have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of '596's apparatus with '400's teaching of a tunable semiconductor laser as the light source so as to keep the optical system compact and allow for changing of the frequency without changing the amplitude.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. ("A Hollow Waveguide Integrated Optic System with an Integrated Laser Source", Proceeding of SPIE, Vol. 4035 (2000), Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448 B2).

In Re claim 22, Foord et al. teaches at least one laser for producing information modulating radiation (CO₂, as the laser is for producing the information, which is achieved on the return signal to the system), modulation means to for information modulating radiation output by each of said one or more lasers (quarter-wave plate, fig. 1, pg. 347), characterized in that the apparatus comprises hollow core optical waveguides formed in a substrate (HOWIO) for guiding radiation from the one or more lasers to the modulation means and from the modulation means to the output means (section 1 par. 2). Foord et al. is silent to an output means for outputting the modulated radiation produced by the modulation means. '448 teaches attaching an optical fiber via a v-groove through the use of an adhesive on a semiconductor substrate for alignment to the laser diode (col. 14, lines 1 – 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Foord et al.'s transmitting apparatus with a hollow waveguide with '448's teaching attaching an optical fiber via a v-groove through the use of an adhesive on a semiconductor substrate and integrating the

use of an adhesive on a grooved area for attaching an optical fiber at the output of the HOWIO subsystem, which then allows for a multitude of mounting arrangements of the HOWIO as the optical fiber can be easily maneuvered to direct the output at the desired target.

Claims 23 – 28, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. “A Hollow Waveguide Integrated Optic System for a 10.6 μ m Range-Doppler Imaging Lidar”, Proceeding of SPIE, Vol. 4034 (2000) Pages 108 – 113) in view of Akashi et al. (U.S. Patent # 6,934,448 B2).

In Re claim 23, Jenkins et al. teaches at least one hollow core optical waveguide formed in a substrate (HOWIO); one or more detectors (fig. 3) and said at least one hollow waveguide guiding said radiation in two transverse directions (fig. 2, as the return signal must be analyzed). Jenkins et al. is silent to one or more optical fibre attachment means, the one or more optical fibre attachment means adapted to receive one or more optical fibres, wherein said radiation is guided from the one or more optical fibres to the one or more detectors by said at least one hollow core optical waveguide. ‘448 teaches attaching an optical fiber via a v-groove on a semiconductor substrate for alignment to the laser diode (col. 8, lines 14 – 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Jenkins et al. ‘s transmitting apparatus with a hollow waveguide with ‘448’s teaching attaching an optical fiber via a v-groove through the use of an adhesive on a semiconductor substrate and integrating the use of an adhesive on a grooved area for attaching an optical fiber at the output of the HOWIO subsystem, which then allows for a multitude of

mounting arrangements of the HOWIO as the optical fiber can be easily maneuvered to direct the output at the desired target.

In Re claim 24, Jenkins et al. teaches a plurality of detectors (fig. 3).

In Re claim 25, the previous combination teaches the claimed invention except for a plurality of attachment means and a plurality of optical fibres. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an attachment means and an optical fiber at each of the detectors to avoid difficulty in alignment of all the detectors, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

In Re claim 26, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

In Re claim 27, the fiber attachment means at the output (Main T/R) with receive a signal different from the one it transmits.

In Re claim 28, the Brewster plate separates the receiving signal from the transmitting signal each goes to a Pulse Detector and a Het. Signal Detector (fig. 3).

In Re claim 33, Jenkins et al. teaches a transmitter and receiver (fig. 3).

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. "A Hollow Waveguide Integrated Optic System for a 10.6 um Range-Doppler Imaging Lidar", Proceeding of SPIE, Vol. 4034 (2000) Pages 108 – 113) in view of Akashi et al. (U.S. Patent # 6,934,448 B2) and further in view of Byren et al. (U.S. Patent # 6,765,663 B2).

The previous combination teaches the apparatus of claim 33 as previously discussed above, but is silent to the receiver and transmitter being formed on a common substrate. '633 teaches a transceiver (58) package. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the previous combination with '633's teaching of a laser transceiver so as to minimize the size of the apparatus.

Claim 23, and 29 – 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. "(A Hollow Waveguide Integrated Optic System with at Integrated Laser Source", Proceeding of SPIE, Vol. 4035 (2000) Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448 B2).

An information modulated radiation receiver apparatus comprising: at least one hollow core optical waveguide formed in a substrate (HOWIO); one or more detectors (section 1, par. 1) and said at least one hollow waveguide guiding said radiation in two transverse directions

(section 3, par. 2 and fig. 1 as the return signal must be analyzed). Foord et al. is silent to one or more optical fibre attachment means, the one or more optical fibre attachment means adapted to receive one or more optical fibres, wherein said radiation is guided from the one or more optical fibres to the one or more detectors by said at least one hollow core optical waveguide. '448 teaches attaching an optical fiber via a v-groove on a semiconductor substrate for alignment to the laser diode (col. 8, lines 14 – 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Foord et al. 's transmitting apparatus with a hollow waveguide with '448's teaching attaching an optical fiber via a v-groove through the use of an adhesive on a semiconductor substrate and integrating the use of an adhesive on a grooved area for attaching an optical fiber at the output of the HOWIO subsystem, which then allows for a multitude of mounting arrangements of the HOWIO as the optical fiber can be easily maneuvered to direct the output at the desired target.

In Re claim 29, Foord et al. teaches a VOA (section 2, par. 3, as an EO can vary the amplitude which is changing the attenuation).

In Re claim 30, Foord et al. teaches a wavelength selective filter (the laser).

In Re claim 31, '448 teaches mode matching means (51).

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. "(A Hollow Waveguide Integrated Optic System with at Integrated Laser Source", Proceeding of

SPIE, Vol. 4035 (2000) Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448) and further in view of Nelson et al. (U.S. Patent # 3,984,332).

The previous combination teaches the apparatus of claim 6 as previously discussed above, but is silent to a lensed output optical fiber. '332 teaches a lensed output optical fiber (col. 4, lines 37 – 40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with '322's teaching of a lensed output optical fiber to minimize dispersion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chad H. Smith whose telephone number is (571) 270-1294. The examiner can normally be reached on Monday-Thursday 7:00 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Uyen-Chau Le can be reached on 571-272-2397. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chad H Smith/
Examiner, Art Unit 2874

/UYEN-CHAUN. LE/
Supervisory Patent Examiner, Art Unit 2874